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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/758,873	01/10/2001	Shiping Chen	473532000100	9840

25226 7590 12/13/2002
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755 PAGE MILL RD
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EXAMINER

FORMAN, BETTY J

ART UNIT PAPER NUMBER

1634

DATE MAILED: 12/13/2002

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/758,873

Applicant(s)

CHEN ET AL.

Examiner

BJ Forman

Art Unit

1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) 13-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 28-58 is/are rejected.
- 7) ☒ Claim(s) 56 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4579
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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FINAL ACTION

1. This action is in response to papers filed 3 October 2002 in Paper No. 12 in which claims 1, 9-12 and 39-44 were amended and claims 45-58 were added. All of the amendments have been thoroughly reviewed and entered. The previous rejections in the Office Action of Paper No. 11 dated 3 July 2002 under 35 U.S.C. 112, second paragraph are withdrawn in view of the amendments. The previous rejections under 35 U.S.C. 102 (b); 102(e); and 103(a) are maintained as described below. All of the arguments have been thoroughly reviewed and are discussed below. New grounds for rejection are discussed.

Claims 1-12, 28-58 are under prosecution.

Priority

2. Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged. However, the provisional application upon which priority is claimed fails to provide adequate support under 35 U.S.C. 112 for claims 2-5 and 9-12 of this application. Provisional Applications 60/175,255, filed 01/10/2000; Provisional Application 60/190,495, filed 03/20/2000; and Provisional Application 60/227,874, filed 08/25/2000 do not teach or describe the dimensions of the discrete area containing probe as recited in Claims 2-5 and they do not teach or describe the ratio of length to width of the substrate as recited in Claims 9-12. Therefore, the effective filing date for Claims 2-5 and 9-12 is the filing date of Provisional Application 60/244,418 i.e. 10/30/2000.

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Response to Priority

3. Applicant states that, while not necessarily agreeing, it is not necessary to address the support for Claims 9-12. Applicant's comments are acknowledged.

Claim Objections

4. Claim 56 is objected to because "carries" is misspelled.
Appropriate correction is required.

Specification

5. The amendment filed 3 October 2002 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

Amendments to Claim 1 (from which all pending claims depend) recite "wherein the flexible elongated substrate is coiled with overlapping portions and non-overlapping portions and said probes are present on said non-overlapping portions". Applicant points to pages 53, line 4-page 56, line 11 and Fig. 8-11 for support of the amendments. The cited passages describe Fig. 8-11 and the probe carriers comprising a support member selected from a pin, rod, coil or spool and having a probe thread around the support member. However, the cited passages do not disclose or describe a substrate coiled with overlapping portions and non-overlapping portions and said probes are present on said non-overlapping portions.

New Claim 53 recites "the planar disk support member has a spiral groove about an axis in a surface of the planar disk"; new Claim 55 recites "the flexible thread has a D-shape"; new Claim 57 recites "probes are arranged in a linear configuration of spots"; and new Claims 58 recites "probe are arranged in a linear configuration of stripes said stripes being at an angle to the long axis of the substrate". Applicant points to pages 53, line 4-page 56, line 11 and Fig. 8-11 for support of the amendments. The cited passages describe Fig. 8-11 and the probe carriers having a flexible thread wound around a pin, rod, coil or spool. However, the cited passages do not disclose or describe a spiral groove about an axis in a surface of the planar disk, the flexible thread having a D-shape, a linear configuration of spots or stripes being at an angle to the long axis of the substrate.

Therefore, the amendments introduce new matter into the disclosure of the specification.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

35 U.S.C. 112: first paragraph

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-12 and 28-58 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably

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convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The recitation "wherein the flexible elongated substrate is coiled with overlapping portions and non-overlapping portions and said probes are present on said non-overlapping portions" is added to the newly amended independent claim 1 (from which all pending claims depend). However, the specification fails to define or provide any disclosure to support such claim recitation. Applicant points to pages 53, line 4-page 56, line 11 and Fig. 8-11 for support of the amendments. The cited passages describe Fig. 8-11 and probe carriers comprising a support member selected from a pin, rod, coil or spool and having a probe thread around the support member. The cited passages do not disclose or describe a substrate coiled with overlapping portions and non-overlapping portions and said probes are present on said non-overlapping portions. Therefore, the amendments introduce subject matter not described in the specification.

The recitations "a spiral groove about an axis in a surface of the planar disk", "the flexible thread has a D-shape", "probes arranged in a linear configuration of spots" and "probes arranged in a linear configuration of said stripes being at an angle to the long axis of the substrate" are added to newly amended Claims 55, 57 and 58 respectively. Applicant points to pages 53, line 4-page 56, line 11 and Fig. 8-11 for support of the amendments. The cited passages describe Fig. 8-11 and the probe carriers having a flexible thread wound around a pin, rod, coil or spool. However, the cited passages do not disclose or describe a spiral groove about an axis in a surface of the planar disk, the flexible thread having a D-shape, probes in a linear configuration of spots, or probes in a linear configuration of stripes being at an angle to the long axis of the substrate. Therefore, the amendments introduce subject matter not described in the specification.

MPEP 2163.06 notes "IF NEW MATTER IS ADDED TO THE CLAIMS, THE EXAMINER SHOULD REJECT THE CLAIMS UNDER 35 U.S.C. 112, FIRST PARAGRAPH - WRITTEN DESCRIPTION REQUIREMENT. *IN RE RASMUSSEN*, 650 F.2d 1212, 211 USPQ 323 (CCPA 1981)." MPEP 2163.02 teaches that "Whenever the issue arises, the fundamental factual inquiry is whether a claim defines an

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invention that is clearly conveyed to those skilled in the art at the time the application was filed...If a claim is amended to include subject matter, limitations, or terminology not present in the application as filed, involving a departure from, addition to, or deletion from the disclosure of the application as filed, the examiner should conclude that the claimed subject matter is not described in that application." MPEP 2163.06 further notes "WHEN AN AMENDMENT IS FILED IN REPLY TO AN OBJECTION OR REJECTION BASED ON 35 U.S.C. 112, FIRST PARAGRAPH, A STUDY OF THE ENTIRE APPLICATION IS OFTEN NECESSARY TO DETERMINE WHETHER OR NOT "NEW MATTER" IS INVOLVED. APPLICANT SHOULD THEREFORE SPECIFICALLY POINT OUT THE SUPPORT FOR ANY AMENDMENTS MADE TO THE DISCLOSURE" (emphasis added).

35 U.S.C. 112: second paragraph

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim 58 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 58 is indefinite for the recitation "at an angle to the long axis of the substrate" because "the long axis" lacks proper antecedent basis in Claim 1. The recitation is further indefinite because it is unclear what limitations "an angle" places on the stripes. Angles are measured in degrees from 0 to 360. The recitation encompasses any angle from 0 to 360. Therefore, the angled relationship between the strips and the substrate is undefined. It is suggested that Claim 58 be amended to define the angled relationship and to provide proper antecedent basis.

Previous Rejections not addressing the New Matter

10. The rejections below do not address the amendment "wherein the flexible elongated substrate is coiled with overlapping portions and non-overlapping portions and said probes are present on said non-overlapping portions" because the amendments introduce new matter.

The rejections are reiterated below for applicant's convenience.

The previous rejections of Claims 1, 6-7, 28-33 and 35-44 under 35 U.S.C. 102(e) over Tajima have been changed to 102(a). The previous rejections of Claims 2-5 under 35 U.S.C. 102(e) are maintained.

The previous rejections of Claims 1, 6-8, 28-33 and 35-44 under 35 U.S.C. 102(b) over Siegesmund have been changed to 102(a).

New and additional rejections which address the amendments are discussed at the end of this action.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

12. Claims 1, 6, 7, 9, 28, 30, 33-44 are rejected under 35 U.S.C. 102(b) as being anticipated by Stimpson et al (BioTechniques, 1998, 25(5): 886-890).

Regarding Claim 1, Stimpson et al disclose an apparatus for allowing specific identification of samples with probes comprising: a flexible elongated substrate having a first substrate surface, a length and a width; a plurality of non-identical probes immobilized on discrete areas (i.e. lane) of a probe-containing portion of the substrate surface each of said discrete areas containing one probe (page 887, left column and Fig. 1 and 2). The additional probes on the substrate of Stimpson are encompassed by the open claim language "containing".

The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997) (see MPEP, 2111.03).

Regarding Claim 6, Stimpson et al disclose the apparatus of Claim 1 wherein the probes are polynucleotides (page 886, right column, first paragraph).

Regarding Claim 7, Stimpson et al disclose the apparatus of Claim 1 wherein the substrate is a polymer i.e. polyethersulfone (page 887, left column, first full paragraph).

Regarding Claim 9, Stimpson et al disclose the apparatus of Claim 1 wherein the ratio of length to width of the substrate exceeds 5:1 (page 887, left column, second full paragraph).

Regarding Claim 28, Stimpson et al disclose the apparatus of Claim 1 further comprising a spool (i.e. rod) about which said substrate is wrapped (page 887, left column, second full paragraph and Fig. 2).

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Regarding Claim 30, Stimpson et al disclose the apparatus of Claim 1 further comprising a drum (i.e. rod) about which said substrate is wrapped (page 887, left column, second full paragraph and Fig. 2).

Regarding Claim 33, Stimpson et al disclose the apparatus of Claim 1 wherein said substrate is coiled about an elongated support member (i.e. rod) (page 887, left column, second full paragraph and Fig. 2).

Regarding Claim 34, Stimpson et al disclose the elongated support member has a diameter of less than about 10 m m (page 887, left column, second full paragraph and Fig. 2).

Regarding Claim 35, Stimpson et al disclose the elongated support member has a diameter of between about 10 m m and 150 mm (page 887, left column, second full paragraph and Fig. 2).

Regarding Claim 36, Stimpson et al disclose the apparatus of Claim 28 wherein the probes are polynucleotides (page 886, right column, first paragraph).

Regarding Claim 37, Stimpson et al disclose the apparatus of Claim 30 wherein the probes are polynucleotides (page 886, right column, first paragraph).

Regarding Claim 38, Stimpson et al disclose the apparatus of Claim 33 wherein the probes are polynucleotides (page 886, right column, first paragraph).

Regarding Claim 39, Stimpson et al disclose the apparatus of Claim 28 wherein the probe is a nucleic acid (page 886, right column, first paragraph) which can bind to a target selected from a complementary polynucleotide, a complementary oligonucleotide, a nucleic acid binding protein, a nucleic acid binding polypeptide or a nucleic acid binding antibody.

Regarding Claim 40, Stimpson et al disclose the apparatus of Claim 30 wherein the probe is a nucleic acid (page 886, right column, first paragraph) which can bind to a target selected from a complementary polynucleotide, a complementary oligonucleotide, a nucleic acid binding protein, a nucleic acid binding polypeptide or a nucleic acid binding antibody.

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Regarding Claim 41, Stimpson et al disclose the apparatus of Claim 33 wherein the probe is a nucleic acid (page 886, right column, first paragraph) which can bind to a target selected from a complementary polynucleotide, a complementary oligonucleotide, a nucleic acid binding protein, a nucleic acid binding polypeptide or a nucleic acid binding antibody.

Regarding Claim 42, Stimpson et al disclose the apparatus of Claim 28 wherein the probe carrier comprises a substrate which is a polymer i.e. polyethersulfone (page 887, left column, first full paragraph).

Regarding Claim 43, Stimpson et al disclose the apparatus of Claim 30 wherein the probe carrier comprises a substrate which is a polymer i.e. polyethersulfone (page 887, left column, first full paragraph).

Regarding Claim 44, Stimpson et al disclose the apparatus of Claim 33 wherein the probe carrier comprises a substrate which is a polymer i.e. polyethersulfone (page 887, left column, first full paragraph).

Response to Arguments

13. Applicant argues that Stimpson does not teach or disclose overlapping portions and non-overlapping portions of the substrate. The argument has been considered but is deemed moot in view of the above rejections which do not address the new matter limitations. Applicant's description of Fig. 8 and 10c wherein elements of the figures are defined as overlapping and non-overlapping is noted. However, the description is not found in the specification and therefore is not relevant to the above rejection.

Applicant further argues that Stimpson's probes are only present on overlapping regions. The argument is not found persuasive because the claim is drawn to probes present on non-overlapping surface of the substrate. The claim is not drawn to probes present ONLY on non-overlapping portions. Stimpson's upper surface of the substrate slice contains probes and is non-overlapping. Therefore, the substrate of Stimpson is encompassed by the claim.

14. Claims 1-4, 6-9, 28, 30 and 33-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Stimpson et al (U.S. Patent No. 6,037,186, filed 16 July 1997).

Regarding Claim 1, Stimpson et al disclose an apparatus for allowing specific identification of samples with probes comprising: a flexible elongated substrate having a first substrate surface, a length and a width; a plurality of non-identical probes immobilized on discrete areas (i.e. lane) of a probe-containing portion of the substrate surface each of said discrete areas containing one probe (Column 5, lines 9-39). The additional probes on the substrate of Stimpson are encompassed by the open claim language "containing".

The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997) (see MPEP, 2111.03).

Regarding Claim 2, Stimpson et al disclose the apparatus of Claim 1 wherein the area containing one probe has a length not exceeding 500 micrometers i.e. the printed lines are 50 to 100 micrometers (Column 8, lines 14-23) and the array bundle is sliced to a thinness of 200 micrometers (Column 9, lines 11-17) providing length to width dimensions of 50 to 200.

Regarding Claim 3, Stimpson et al disclose the apparatus of Claim 1 wherein the area containing one probe has a length not exceeding 100 micrometers i.e. the printed lines are 50 to 100 micrometers (Column 8, lines 14-23) and the array bundle is sliced to a thinness of 200 micrometers (Column 9, lines 11-17) providing length to width dimensions of 50 to 200.

Regarding Claim 4, Stimpson et al disclose the apparatus of Claim 1 wherein the area containing one probe has a length not exceeding 50 micrometers i.e. the printed lines are 50 to 100 micrometers (Column 8, lines 14-23) and the array bundle is sliced to a thinness of 200 micrometers (Column 9, lines 11-17) providing length to width dimensions of 50 to 200.

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Regarding Claim 6, Stimpson et al disclose the apparatus of Claim 1 wherein the probes are polynucleotides and polypeptides (Column 3, lines 46-54).

Regarding Claim 7, Stimpson et al disclose the apparatus of Claim 1 wherein the substrate material is selected from silica, glass optical fibers, plastics, polymers and polytetrafluoroethylene (Column 10, lines 16-57).

Regarding Claim 8, Stimpson et al disclose the apparatus of Claim 1 further comprising a first marker which conveys information about a first set of probes and a second marker which conveys information about a second set of probes (Column 7, lines 49-54).

Regarding Claim 9, Stimpson et al disclose the apparatus of Claim 1 wherein the ratio of length to width of the substrate exceeds 5:1 i.e. 21.5 foot x 8 inches (Column 9, lines 1-2 and 11-15).

Regarding Claim 28, Stimpson et al disclose the apparatus of Claim 1 further comprising a spool (i.e. rod-shaped support) about which said substrate is wrapped (Column 7, line 66-Column 8, line 8).

Regarding Claim 30, Stimpson et al disclose the apparatus of Claim 1 further comprising a drum (i.e. rod-shaped support) about which said substrate is wrapped (Column 7, line 66-Column 8, line 8).

Regarding Claim 33, Stimpson et al disclose the apparatus of Claim 1 wherein said substrate is coiled about an elongated support member (i.e. rod-shaped support) (Column 7, line 66-Column 8, line 8).

Regarding Claim 34, Stimpson et al disclose the elongated support member has a diameter of less than about 10 m m (Column 8, lines 49-56).

Regarding Claim 35, Stimpson et al disclose the elongated support member has a diameter of between about 10 m m and 150 m m (Column 8, lines 49-56).

Regarding Claim 36, Stimpson et al disclose the apparatus of Claim 28 wherein the probes are selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, antibodies (Column 3, lines 46-54).

Regarding Claim 37, Stimpson et al disclose the apparatus of Claim 30 wherein the probes are selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, antibodies (Column 3, lines 46-54).

Regarding Claim 38, Stimpson et al disclose the apparatus of Claim 33 wherein the probes are selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, antibodies (Column 3, lines 46-54).

Regarding Claim 39, Stimpson et al disclose the apparatus of Claim 28 wherein the probe can bind to a target selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, antibodies, cell receptors and ligands (Column 6, lines 8-36).

Regarding Claim 40, Stimpson et al disclose the apparatus of Claim 30 wherein the probe can bind to a target selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, antibodies, cell receptors and ligands (Column 6, lines 8-36).

Regarding Claim 41, Stimpson et al disclose the apparatus of Claim 33 wherein the probe can bind to a target selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, antibodies, cell receptors and ligands (Column 6, lines 8-36).

Regarding Claim 42, Stimpson et al disclose the apparatus of Claim 28 wherein the probe carrier comprises a substrate selected from silica, glass optical fibers, plastics, polymers and polytetrafluoroethylene (Column 10, lines 16-57).

Regarding Claim 43, Stimpson et al disclose the apparatus of Claim 30 wherein the probe carrier comprises a substrate selected from silica, glass optical fibers, plastics, polymers and polytetrafluoroethylene (Column 10, lines 16-57).

Regarding Claim 44, Stimpson et al disclose the apparatus of Claim 33 wherein the probe carrier comprises a substrate selected from silica, glass optical fibers, plastics, polymers and polytetrafluoroethylene (Column 10, lines 16-57).

Response to Arguments

15. Applicant argues that Stimpson does not teach or disclose overlapping portions and non-overlapping portions of the substrate. The argument has been considered but is deemed moot in view of the above rejections which do not address the new matter limitations. Applicant's description of Fig. 8 and 10c wherein elements of the figures are defined as overlapping and non-overlapping is noted. However, the description is not found in the specification and therefore is not relevant to the above rejection.

Applicant further argues that Stimpson's probes are only present on overlapping regions. The argument is not found persuasive because the claim is drawn to probes present on non-overlapping surface of the substrate. The claim is not drawn to probes present ONLY on non-overlapping portions. Stimpson's upper surface of the substrate slice contains probes and is non-overlapping. Therefore, the substrate of Stimpson is encompassed by the claim.

16. Claims 1, 6-8, 28-33 and 35-44 are rejected under 35 U.S.C. 102(a) as being anticipated by Siegesmund (WO 99/39186, published 5 August 1999).

Regarding Claim 1, Siegesmund discloses an apparatus for allowing specific identification of samples with probes comprising: a flexible elongated substrate having a first substrate surface, a length and a width; a plurality of non-identical probes immobilized on discrete areas (i.e. lane) of a probe-containing portion of the substrate surface each of said

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discrete areas containing one probe (page 6, lines 3-33). The additional probes on the substrate of Stimpson are encompassed by the open claim language "containing".

The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997) (see MPEP, 2111.03).

Regarding Claim 6, Siegesmund discloses the apparatus of Claim 1 wherein the probes are polypeptides (page 7, lines 8-11).

Regarding Claim 7, Siegesmund discloses the apparatus of Claim 1 wherein the substrate material is selected from plastics and polymers (page 7, lines 11-25).

Regarding Claim 8, Siegesmund discloses the apparatus of Claim 1 further comprising a first marker which conveys information about a first set of probes and a second marker which conveys information about a second set of probes (page 8, lines 25-34).

Regarding Claim 28, Siegesmund discloses the apparatus of Claim 1 further comprising a spool about which said substrate is wrapped (page 9, lines 22-26).

Regarding Claim 29, Siegesmund discloses the apparatus of Claim 28 wherein the substrate comprises a thread (i.e. fiber) (page 7, lines 21-23).

Regarding Claim 30, Siegesmund discloses the apparatus of Claim 1 further comprising a drum (i.e. spool) about which said substrate is wrapped (page 9, lines 22-26).

Regarding Claim 31, Siegesmund discloses the apparatus of Claim 30 wherein the substrate comprises a thread (i.e. fiber) (page 7, lines 21-23).

Regarding Claim 32, Siegesmund discloses the apparatus of Claim 31 wherein a first portion of said substrate sit adjacent a second portion on a surface of said drum (Fig. 2).

Regarding Claim 33, Siegesmund discloses the apparatus of Claim 1 wherein said substrate is coiled about an elongated support member (i.e. spool) (page 9, lines 22-26).

Regarding Claim 36, Siegesmund discloses the apparatus of Claim 28 wherein the probes are selected from the group consisting of proteins, polypeptides, antibodies (page 7, lines 8-11).

Regarding Claim 37, Siegesmund discloses the apparatus of Claim 30 wherein the probes are selected from the group consisting of proteins, polypeptides, antibodies (page 7, lines 8-11).

Regarding Claim 38, Siegesmund discloses the apparatus of Claim 33 wherein the probes are selected from the group consisting of proteins, polypeptides, antibodies (page 7, lines 8-11).

Regarding Claim 39, Siegesmund discloses the apparatus of Claim 28 wherein the probe can bind to a target selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, antibodies, cell receptors and ligands (page 4, lines 17-35).

Regarding Claim 40, Siegesmund discloses the apparatus of Claim 30 wherein the probe can bind to a target selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, antibodies, cell receptors and ligands (page 4, lines 17-35).

Regarding Claim 41, Siegesmund discloses the apparatus of Claim 33 wherein the probe can bind to a target selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, antibodies, cell receptors and ligands (page 4, lines 17-35).

Regarding Claim 42, Siegesmund discloses the apparatus of Claim 28 wherein the probe carrier comprises a substrate selected from plastics and polymers (page 7, lines 8-25).

Regarding Claim 43, Siegesmund discloses the apparatus of Claim 30 wherein the probe carrier comprises a substrate selected from plastics and polymers (page 7, lines 8-25).

Regarding Claim 44, Siegesmund discloses the apparatus of Claim 33 wherein the probe carrier comprises a substrate selected from plastics and polymers (page 7, lines 8-25).

Response to Arguments

17. Applicant argues that the above rejection is incorrect because the effective filing date of Claim 1 is 10 January 2000 and as such, Siegesmund is not prior art under 35 U.S.C. 102 (b). The argument has been considered. The above rejection has been changed to 35 U.S.C. 102(a) correcting the error.

Applicant argues that Siegesmund does not teach or disclose overlapping portions and non-overlapping portions of the substrate. The argument has been considered but is deemed moot in view of the above rejections which do not address the new matter limitations. Applicant's description of Fig. 8 and 10c wherein elements of the figures are defined as overlapping and non-overlapping is noted. However, the description is not found in the specification and therefore is not relevant to the above rejection.

18. Claims 2-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Tajima (U.S. Patent Application Publication No. 2001/0031495 A1, filed 13 March 2000).

Regarding Claim 2, Tajima discloses an apparatus for allowing specific identification of samples with probes comprising: a flexible elongated substrate having a first substrate surface, a length and a width; a plurality of non-identical probes immobilized on discrete areas (i.e. lane) of a probe-containing portion of the substrate surface each of said discrete areas containing one probe (page 10-11, ¶ 0163-0164) wherein each discrete area containing one probe has a length not exceeding 500 micrometers (page 11, ¶ 0165).

Regarding Claim 3, Tajima discloses the apparatus of Claim 1 wherein each discrete area containing one probe has a length not exceeding 100 micrometers (page 11, ¶ 0165).

Regarding Claim 4, Tajima discloses the apparatus of Claim 1 wherein each discrete area containing one probe has a length not exceeding 50 micrometers (page 11, ¶ 0165).

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Regarding Claim 5, Tajima discloses the apparatus of Claim 1 wherein each discrete area containing one probe has a length not exceeding 200 micrometers (page 11, ¶ 0165).

Response to Arguments

19. Applicant argues that the above rejection is incorrect because the effective filing date of Claim 1 is 10 January 2000 and as such, Tajima is not prior art under 35 U.S.C. 102 (e). The argument has been considered. However, the effective filing date for Claims 2-5 is 10/30/2000. Therefore, Tajima is prior art under 35 U.S.C. 102(e) and the above rejection is proper.

20. Claims 1, 6, 7 28-33 and 35-44 are rejected under 35 U.S.C. 102(a) as being anticipated by Tajima (U.S. Patent Application Publication No. 2001/0031495 A1, filed 13 March 2000).

Regarding Claim 1, Tajima discloses an apparatus for allowing specific identification of samples with probes comprising: a flexible elongated substrate having a first substrate surface, a length and a width; a plurality of non-identical probes immobilized on discrete areas (i.e. lane) of a probe-containing portion of the substrate surface each of said discrete areas containing one probe (page 10-11, ¶ 0163-0164). The additional probes on the substrate of Stimpson are encompassed by the open claim language "containing".

The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997) (see MPEP, 2111.03).

Regarding Claim 2, Tajima discloses the apparatus of Claim 1 wherein each discrete area containing one probe has a length not exceeding 500 micrometers (page 11, ¶ 0165).

Regarding Claim 3, Tajima discloses the apparatus of Claim 1 wherein each discrete area containing one probe has a length not exceeding 100 micrometers (page 11, ¶ 0165).

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Regarding Claim 4, Tajima discloses the apparatus of Claim 1 wherein each discrete area containing one probe has a length not exceeding 50 micrometers (page 11, ¶ 0165).

Regarding Claim 5, Tajima discloses the apparatus of Claim 1 wherein each discrete area containing one probe has a length not exceeding 200 micrometers (page 11, ¶ 0165).

Regarding Claim 6, Tajima discloses the apparatus of Claim 1 wherein the probes are polynucleotides, polypeptides and polysaccharides (page 16, ¶ 0253).

Regarding Claim 7, Tajima discloses the apparatus of Claim 1 wherein the substrate material is selected from silica, glass fibers, metals magnetizable materials, plastics and polymers (page 10, ¶ 0163).

Regarding Claim 28, Tajima discloses the apparatus of Claim 1 further comprising a spool (i.e. rolling core) about which said substrate is wrapped (page 13, ¶ 199).

Regarding Claim 29, Tajima discloses the apparatus of Claim 28 wherein the substrate comprises a thread (Abstract).

Regarding Claim 30, Tajima discloses the apparatus of Claim 1 further comprising a drum (i.e. rolling core) about which said substrate is wrapped (page 13, ¶ 199).

Regarding Claim 31, Tajima discloses the apparatus of Claim 30 wherein the substrate comprises a thread (Abstract).

Regarding Claim 32, Tajima discloses the apparatus of Claim 31 wherein a first portion of said substrate sit adjacent a second portion on a surface of said drum (Fig. 3).

Regarding Claim 33, Tajima discloses the apparatus of Claim 1 wherein said substrate is coiled about an elongated support member (i.e. rolling core) (page 13, ¶ 199).

Regarding Claim 36, Tajima discloses the apparatus of Claim 28 wherein the probes are selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, oligosaccharides and antibodies (page 16, ¶ 0253).

Regarding Claim 37, Tajima discloses the apparatus of Claim 30 wherein the probes are selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, oligosaccharides and antibodies (page 16, ¶ 0253).

Regarding Claim 38, Tajima discloses the apparatus of Claim 33 wherein the probes are selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, oligosaccharides and antibodies (page 16, ¶ 0253).

Regarding Claim 39, Tajima discloses the apparatus of Claim 28 wherein the probe can bind to a target selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, antibodies, cell receptors and ligands (page 16, ¶ 0253).

Regarding Claim 40, Tajima discloses the apparatus of Claim 30 wherein the probe can bind to a target selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, antibodies, cell receptors and ligands (page 16, ¶ 0253).

Regarding Claim 41, Tajima discloses the apparatus of Claim 33 wherein the probe can bind to a target selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, antibodies, cell receptors and ligands (page 16, ¶ 0253).

Regarding Claim 42, Tajima discloses the apparatus of Claim 28 wherein the probe carrier comprises a substrate selected from silica, glass fibers, metals magnetizable materials, plastics and polymers (page 10, ¶ 0163).

Regarding Claim 43, Tajima discloses the apparatus of Claim 30 wherein the probe carrier comprises a substrate selected from silica, glass fibers, metals magnetizable materials, plastics and polymers (page 10, ¶ 0163).

Regarding Claim 44, Tajima discloses the apparatus of Claim 33 wherein the probe carrier comprises a substrate selected from silica, glass fibers, metals magnetizable materials, plastics and polymers (page 10, ¶ 0163).

Response to Arguments

21. Applicant argues that the above rejection is incorrect because the effective filing date of Claim 1 is 10 January 2000 and as such, Tajima is not prior art under 35 U.S.C. 102 (e). The argument has been considered. The above rejection has been changed to 35 U.S.C. 102(a) correcting the error.

Claim Rejections - 35 USC § 103

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

23. Claims 5 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stimpson et al (U.S. Patent No. 6,037,186, filed 16 July 1997).

Regarding Claim 5, Stimpson et al teach an apparatus for allowing specific identification of samples with probes comprising: a flexible elongated substrate having a first substrate surface, a length and a width; a plurality of non-identical probes immobilized on discrete areas (i.e. lane) of a probe-containing portion of the substrate surface each of said discrete areas containing one probe (Column 5, lines 9-39) wherein the area containing one probe has a length not exceeding 500 micrometers i.e. the printed lines are 50 to 100 micrometers (Column 8, lines 14-23) and the array bundle is sliced to a thinness of 200 micrometers (Column 9, lines 11-17) providing length to width dimensions of 50 to 200 but they do not teach a discrete area length not exceeding 20 micrometers. However, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was

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made to modify the area length of Stimpson et al using routine experimentation to derive optimal area length e.g. 20 micrometers for the obvious benefits of optimizing apparatus dimensions to thereby maximize experimental results. It is noted that *In re Aller*, 220 F.2d 454,456, 105 USPQ 233,235 states where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum by routine experimentation.

Regarding Claim 10-12, Stimpson et al teach the apparatus of Claim 1 wherein the ratio of length to width of the substrate exceeds 5:1 i.e. 21.5 foot x 8 inches (Column 9, lines 1-2 and 11-15) but they do not teach the ratio exceeds 100:1 (Claim 10); exceeds 10,000:1 (Claim 11); and exceeds 100,000:1 (Claim 12). However, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the length to width ratio of Stimpson et al using routine experimentation to derive optimal ratios e.g. 100:1, 10,000:1 or 100,000:1 for the obvious benefits of optimizing apparatus dimensions to thereby maximize experimental results. It is noted that *In re Aller*, 220 F.2d 454,456, 105 USPQ 233,235 states where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum by routine experimentation.

Response to Arguments

24. Applicant argues that Stimpson does not disclose all the elements of Claim 1 and therefore the rejection is improper. The argument has been considered but is not found persuasive for the reasons stated above.

25. Claims 29, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stimpson et al (a) (U.S. Patent No. 6,037,186, filed 16 July 1997) in view of Heyneker (WO 97/46313, published 11 December 1997).

Regarding Claims 29, 31 and 32, Stimpson et al (a) teach the apparatus of Claim 1 wherein further comprising a spool/drum about which said substrate is wrapped (Column 8,

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lines 44-48) wherein a first portion (i.e. line) of said substrate sits adjacent a second portion (i.e. lines) of said substrate on a surface of the drum (Column 7, lines 49-55) but they do not teach the substrate comprises a thread. However, thread substrates were well known and routinely practiced in the art at the time the claimed invention was made as taught by Heyneker (page 9, lines 12-25). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the thread substrate of Heyneker to the substrate of Stimpson et al and to wrap thread substrates about the spool drum because the wrapped threads would eliminate the substrate slicing in the method of Stimpson et al. Specifically, the substrate sheet of Stimpson et al is wrapped about the spool and then sliced to provide multiple substrates (Column 9, lines 8-16). Using a thread substrate would simplify the apparatus of Stimpson et al by eliminating the slicing step which separates substrate into multiple substrates because the thread substrates are separate from each other. Therefore, one skilled in the art would have been motivated to apply the thread substrates of Heyneker to the apparatus of Stimpson et al for the obvious benefits of eliminating the unnecessary step of slicing.

Response to Arguments

26. Applicant argues that the references do not provide a teaching, suggestion or motivation for combining the Stimpson and Heyneker references.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, using a thread substrate would simplify the apparatus of Stimpson et al by eliminating the slicing step which separates substrate into multiple substrates because the thread substrates are separate from each other. Therefore, one of ordinary skill in the art would have been motivated to apply the thread substrates of Heyneker to the apparatus of Stimpson et al for the obvious benefits of eliminating the unnecessary step of slicing.

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Applicant further argues that using a thread substrate from Heyneker with Stimpson would impermissibly change the principle operation of Stimpson. The argument has been considered but is not found persuasive because Heyneker uses a thread substrate which is wrapped around a support and sectioned to provide multiple substrates (page 11, lines 9-17) and Stimpson wrap a substrate around a support and then section the support to provide multiple substrates (Abstract). Therefore, the principle operations of both Heyneker and Stimpson are the same i.e. wrap and section to provide multiples substrates. Hence the thread substrate of Heyneker would not change the not change the principle operation of Stimpson.

New Rejections Necessitated by Amendment

Claim Rejections - 35 USC § 102

27. Claims 1, 2, 6-12, 28-44, 47, 49, 54 and 56 are rejected under 35 U.S.C. 102(b) as being anticipated by Dehlinger (U.S. Patent No. 5,723,320, issued 3 March 1998).

Regarding Claim 1, Dehlinger discloses an apparatus for allowing specific identification of samples with probes comprising: a flexible elongated substrate having a first substrate surface, a length and a width, and a plurality of non-identical probes immobilized on discrete areas of a probe-containing portion of the substrate surface of each of said discrete areas containing one probe wherein the flexible elongated substrate is coiled with overlapping (exposed) and non-overlapping (non-exposed) portions and said probes are present on said non-overlapping portions (Column 11, lines 1-36 and Claim 10).

Regarding Claim 2, Dehlinger discloses the apparatus wherein each discrete area containing one probe has a length not exceeding 500 micrometers i.e. the smallest spool having

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a dimension of 500 microns forms the apparatus (Column 7, lines 30-35 and Column 6, Table 1).

Regarding Claim 6, Dehlinger discloses the apparatus wherein the probes are polynucleotides (Abstract, Claim 10).

Regarding Claim 7, Dehlinger discloses the apparatus wherein the substrate is made of selected from the group consisting of metals, magnetizable materials, plastics and polymers (Column 7, lines 1-27).

Regarding Claim 8, Dehlinger discloses the apparatus further comprising a first marker which conveys information about a first set of probes and a second marker which conveys information about a second set of probes i.e. tick marks (Column 7, lines 35-43).

Regarding Claims 9-12, Dehlinger discloses the apparatus wherein a ratio of length to width of the substrate exceeds 1:100,000 i.e. 15 microns: 1,024x2 mm (Column 6, lines 44-46 and 65-66).

Regarding Claim 28, Dehlinger disclose the apparatus further comprising a spool about which said substrate is wrapped (Column 5, lines 63-67).

Regarding Claim 29, Dehlinger discloses the apparatus wherein said substrate comprises a thread i.e. filament (Column 5, lines 63-67).

Regarding Claim 30, Dehlinger disclose the apparatus further comprising a drum (i.e. spool) about which said substrate is wrapped (Column 5, lines 63-67).

Regarding Claim 31, Dehlinger discloses the apparatus wherein said substrate comprises a thread i.e. filament (Column 5, lines 63-67).

Regarding Claim 32, Dehlinger discloses the apparatus wherein a first portion of said substrate sits adjacent a second portion of said substrate on a surface of said drum i.e. the filament is wrapped to provide a drum having multiple windings (Column 5, line 63-Column 6, line 10).

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Regarding Claim 33, Dehlinger discloses the apparatus wherein the substrate is coiled about an elongated support member (Column 5, line 63-Column 6, line 10).

Regarding Claim 34, Dehlinger discloses the apparatus wherein the elongated support member has a diameter of less than about 10 m m (Column 6, Table 1) wherein the final and smallest support member forms the apparatus (Column 7, lines 29-35).

Regarding Claim 35, Dehlinger discloses the apparatus wherein the support member has a diameter between about 10m m and 150m m (Column 6, Table 1).

Regarding Claim 36, Dehlinger discloses the apparatus of Claim 28 wherein the probes are polynucleotides (Abstract, Claim 10).

Regarding Claim 37, Dehlinger discloses the apparatus of Claim 30 wherein the probes are polynucleotides (Abstract, Claim 10).

Regarding Claim 38, Dehlinger discloses the apparatus of Claim 33 wherein the probes are polynucleotides (Abstract, Claim 10).

Regarding Claim 39, Dehlinger discloses the apparatus of Claim 28 wherein the probe is a binding partner for a target polynucleotide or oligonucleotide (Column 12, lines 15-34 and Fig. 12).

Regarding Claim 40, Dehlinger discloses the apparatus of Claim 30 wherein the probe is a binding partner for a target polynucleotide or oligonucleotide (Column 12, lines 15-34 and Fig. 12).

Regarding Claim 41, Dehlinger discloses the apparatus of Claim 33 wherein the probe is a binding partner for a target polynucleotide or oligonucleotide (Column 12, lines 15-34 and Fig. 12).

Regarding Claim 42, Dehlinger discloses the apparatus of Claim 28 wherein the substrate is made of selected from the group consisting of metals, magnetizable materials, plastics and polymers (Column 7, lines 1-27).

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Regarding Claim 43, Dehlinger discloses the apparatus of Claim 30 wherein the substrate is made of selected from the group consisting of metals, magnetizable materials, plastics and polymers (Column 7, lines 1-27).

Regarding Claim 44, Dehlinger discloses the apparatus of Claim 33 wherein the substrate is made of selected from the group consisting of metals, magnetizable materials, plastics and polymers (Column 7, lines 1-27).

Regarding Claim 47, Dehlinger discloses the apparatus of Claim 1 further comprising an elongated support member wherein the probe containing portion of the substrate surface is distal from the support member (Column 11, lines 20-36 and Fig. 10).

Regarding Claim 49, Dehlinger discloses the apparatus of Claim 47 wherein the flexible elongated substrate is removably coiled on the support member i.e. the filament is wound onto spools of differing size (Column 6, line 65-Column 7, line 1).

Regarding Claim 54, Dehlinger discloses the apparatus of Claim 1 wherein the flexible elongated substrate is a flexible thread substrate (Column 6, line 65-Column 7, line 7).

Regarding Claim 56, Dehlinger discloses the apparatus of Claim 1 wherein the flexible elongated substrate carries a one-dimensional array of probes (Column 3, lines 55-60 and Claim 10).

Claim Rejections - 35 USC § 103

28. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dehlinger (U.S. Patent No. 5,723,320, issued 3 March 1998) in view of Stimpson (U.S. Patent No. 6,037,186, filed 16 July 1997) and Tajima (U.S. Patent Application Publication No.

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2001/0031495 A1, filed 13 March 2000). As noted above, the effective filing date for instant claims 2-5 is 10/30/2000.

Regarding Claims 3-5, Dehlinger teaches an apparatus for allowing specific identification of samples with probes comprising: a flexible elongated substrate having a first substrate surface, a length and a width, and a plurality of non-identical probes immobilized on discrete areas of a probe-containing portion of the substrate surface of each of said discrete areas containing one probe wherein the flexible elongated substrate is coiled with overlapping (exposed) and non-overlapping (non-exposed) portions and said probes are present on said non-overlapping portions (Column 11, lines 1-36 and Claim 10) wherein each discrete area containing one probe has a length not exceeding 500 micrometers i.e. the smallest spool having a length of 500 microns forms the apparatus (Column 7, lines 30-35 and Column 6, Table 1). Dehlinger does not teach the discrete area has a length not exceeding 100 microns (Claim 3); not exceeding 50 microns (Claim 4); and not exceeding 20 microns (Claim 5).

However, discrete areas containing probes having a length not exceeding 500, 100, 50 and 20 micrometers were well known in the art at the time the claimed invention was made as taught by Stimpson and Tajima.

Stimpson teaches a similar apparatus comprising: a flexible elongated substrate having a first substrate surface, a length and a width; a plurality of non-identical probes immobilized on discrete areas (i.e. lane) of a probe-containing portion of the substrate surface each of said discrete areas containing one probe (Column 5, lines 9-39) wherein the area containing one probe has a length not exceeding 500 micrometers; not exceeding 100 micrometers; and not exceeding 50 micrometers i.e. the printed lines are 50 to 100 micrometers (Column 8, lines 14-23) and the array bundle is sliced to a thinness of 200 micrometers (Column 9, lines 11-17) providing length to width dimensions of 50 to 200.

Tajima teaches a similar apparatus comprising: a flexible elongated substrate having a first substrate surface, a length and a width; a plurality of non-identical probes immobilized on

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discrete areas (i.e. lane) of a probe-containing portion of the substrate surface each of said discrete areas containing one probe (page 10-11, ¶ 0163-0164) wherein each discrete area containing one probe has a length not exceeding 500 micrometers; not exceeding 100; not exceeding 50 micrometers; and not exceeding 20 micrometers (page 11, ¶ 0165).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the probe are length of Dehlinger with the lengths taught by Stimpson and Tajima to thereby optimize the substrate area for the expected benefits of maximizing probe immobilization.

It is noted that *In re Aller*, 220 F.2d 454,456, 105 USPQ 233,235 states where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum by routine experimentation.

29. Claims 45, 46, 48, 50, 52, 55, 57 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dehlinger (U.S. Patent No. 5,723,320, issued 3 March 1998) in view of Stimpson (U.S. Patent No. 6,037,186, filed 16 July 1997).

Regarding Claims 45 and 46, Dehlinger teaches an apparatus for allowing specific identification of samples with probes comprising: a flexible elongated substrate having a first substrate surface, a length and a width, and a plurality of non-identical probes immobilized on discrete areas of a probe-containing portion of the substrate surface of each of said discrete areas containing one probe wherein the flexible elongated substrate is coiled with overlapping (exposed) and non-overlapping (non-exposed) portions and said probes are present on said non-overlapping portions (Column 11, lines 1-36 and Claim 10) wherein the flexible substrate is wound multiple times around the support (Column 5, lines 63-67) but they do not teach the

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winding is in a spiral. However, spiral winding of a flexible support was well known in the art at the time the claimed invention was made as taught by Stimpson.

Stimpson teaches a similar apparatus comprising: a flexible elongated substrate having a first substrate surface, a length and a width; a plurality of non-identical probes immobilized on discrete areas (i.e. lane) of a probe-containing portion of the substrate surface each of said discrete areas containing one probe (Column 5, lines 9-39) wherein the substrate is wound upon itself in a spiral to form a flat spiral whereby multiple, identical, high density arrays are formed (Abstract).

It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the winding of Dehlinger with the spiral winding of Stimpson to thereby provide multiple, identical, high density arrays as taught by Stimpson for the obvious benefits of economy via mass production (Stimpson, Abstract).

Regarding Claim 48, Dehlinger does not teach the apparatus wherein the substrate is attached by an adhesive. However, Stimpson teaches the similar apparatus wherein the substrate is attached by adhesive to at least a portion of the support member wherein the adhesive forms a cohesive structure (Column 5, lines 48-50 and Column 12, lines 65-67). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the apparatus of Dehlinger by attaching the substrate to a portion of the support member as taught by Stimpson (Column 12, lines 65-67) for the expected benefit of forming a cohesive structure as taught by Stimpson (Column 5, lines 48-50).

Regarding Claim 50, Dehlinger teaches the apparatus wherein the probes are mounted on a surface distal to the support member (Column 11, lines 20-37 and Fig. 10) but they do not teach the substrate has a notch and the probes are mounted within the notch. However, Stimpson teaches the similar apparatus wherein the probes are mounted on a surface of the support, the substrate has a notch and the probes are mounted within the notch (Column 7, lines 58-67). It would have been obvious to one of ordinary skill in the art at the time the

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claimed invention was made to modify the substrate of Dehlinger by providing a notch on the surface of the substrate and mounting the probes within the notch as taught by Stimpson for the expected benefit of denoting spatial arrangement of the probes on the substrate as taught by Stimpson (Column 7, lines 49-60).

Regarding Claim 52, Dehlinger teaches the apparatus comprising a support member about which the flexible elongated substrate is coiled wherein the probe containing portion of the substrate is distal from the support and the plurality of probes are circumaxially distributed for receiving a target molecule (Column 11, lines 20-37 and Fig. 10) but they do not teach the support member comprises a planar disk. However, Stimpson teaches the similar apparatus comprising a planar disk (after slicing) having an axis about which the flexible elongated substrate is coiled wherein the probes are mounted on a surface of the support and the probes are circumaxially distributed for receiving target molecules (Column 7, lines 58-67). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the support member Dehlinger with the planar disk support of Stimpson wherein a elongated support is sliced to provide multiple identical substrates having a planar disk support (Fig. 2) for the obvious benefits of providing multiple, identical, high density arrays and economy via mass production (Stimpson, Abstract).

Regarding Claim 55, Dehlinger does not teach the flexible thread had a D-shape. Stimpson teaches the similar apparatus wherein the probes are mounted on a surface of the substrate wherein, the substrate has a D-shape (i.e. notch) and the probes are mounted within the notch (Column 7, lines 58-67). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the substrate of Dehlinger by providing a D-shaped notch on the surface of the substrate and mounting the probes within the notch as taught by Stimpson for the expected benefit of denoting spatial arrangement of the probes on the substrate as taught by Stimpson (Column 7, lines 49-60).

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Regarding Claim 57, Dehlinger does not teach the probes are arranged as a linear configuration of spots. However, Stimpson teaches the similar apparatus wherein the probes are arranged as a linear configuration of spots i.e. the probes are arranged linearly along the flexible substrate using a pipette to dispense solution i.e. spots which are then drawn into lines (Column 8, lines 38-40). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the probe configuration of Dehlinger with the linear configuration of Stimpson thereby providing a identifiable spatial arrangement of the probes for the obvious benefit of simplifying probe and target identification on the substrate as suggested by Stimpson (Column 7, lines 49-60).

Regarding Claim 58, Dehlinger does not teach the probes are arranged as a linear configuration of stripes. However, Stimpson teaches the similar apparatus wherein the probes are arranged as a linear configuration of stripes i.e. lines (Column 8, lines 14-31). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the probe configuration of Dehlinger with the linear strip configuration of Stimpson thereby providing a identifiable spatial arrangement for the obvious benefit of simplifying probe and target identification on the substrate as suggested by Stimpson (Column 7, lines 49-60).

30. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dehlinger (U.S. Patent No. 5,723,320, issued 3 March 1998) in view of Regan et al (U.S. Patent No. 6,361,745, filed 8 September 1999).

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Regarding Claim 51, Dehlinger teaches an apparatus for allowing specific identification of samples with probes comprising: a flexible elongated substrate having a first substrate surface, a length and a width, and a plurality of non-identical probes immobilized on discrete areas of a probe-containing portion of the substrate surface of each of said discrete areas containing one probe wherein the flexible elongated substrate is coiled with overlapping (exposed) and non-overlapping (non-exposed) portions and said probes are present on said non-overlapping portions (Column 11, lines 1-36 and Claim 10) but does not teach the support is contained within a cassette. However, supports contained within cassettes were well known in the art at the time the claimed invention was made as taught by Regan et al. who teach that cassettes easy and inexpensive to produce and protect the substrates from light and particulate matter (Column 3, lines 36-41). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the cassette of Regan et al and to contain the substrate of Dehlinger within a cassette based on the ease and economy of production for the expected benefit of protecting the substrate from light and particulate matter as taught by Regan et al (Column 3, lines 36-41).

31. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dehlinger (U.S. Patent No. 5,723,320, issued 3 March 1998) in view of Heyneker (WO 97/46313, published 11 December 1997).

Regarding Claim 53, Dehlinger teaches an apparatus for allowing specific identification of samples with probes comprising: a flexible elongated substrate having a first substrate surface, a length and a width, and a plurality of non-identical probes immobilized on discrete

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areas of a probe-containing portion of the substrate surface of each of said discrete areas containing one probe wherein the flexible elongated substrate is coiled with overlapping (exposed) and non-overlapping (non-exposed) portions and said probes are present on said non-overlapping portions (Column 11, lines 1-36 and Claim 10) wherein the substrate is wrapped around a support (Column 5, lines 66-67) but they do not teach the support is a planar disk having a spiral groove along which the substrate is coupled. However, grooved planar disk support for coupling a flexible substrate was well known in the art at the time the claimed invention was made as taught by Heyneker. Heyneker teach a similar apparatus comprising a flexible elongated substrate having probes immobilized thereon where the flexible substrate is coupled to a grooved planar disk wherein the grooved planar disk facilitates handling and protects the surface of the substrate (page 11, lines 18-27 and Fig. 3). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the support of Dehlinger with the grooved planar disk of Heyneker and to wrap the flexible substrate around the grooved disk for the expected benefit of facilitating handling of the substrate and protecting the surface of the substrate as taught by Heyneker (page 11, lines 18-27).

Conclusion

32. No claim is allowed.

33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (703) 306-5878. The examiner can normally be reached on 6:30 TO 4:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (703) 308-1152. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-8724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.


BJ Forman, Ph.D.
Patent Examiner
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December 11, 2002